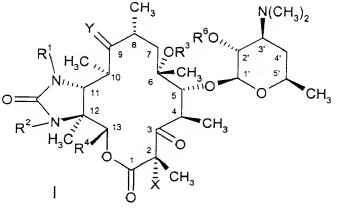
What is claimed is:

1. A compound of the formula



I

or a pharmaceutically acceptable salt, prodrug, or solvate thereof, wherein:

X is Cl, Br, I, or F;

Y is =O, or =NOR^5; or Y means both -H and -OR^5; or both -H and -NR^{5}R^{10};

R^1, R^2, and R^3 are independently selected from H, C_1-C_{10} alkyl, C_2-C_{10} alkenyl, C_2-C_{10} alkynyl, (4- to 10-membered heterocyclic) C_1-C_6 alkyl, (4- to 10-membered heterocyclic) C_2-C_6 alkenyl, (4- to 10-membered heterocyclic) C_2-C_6 alkynyl, (C_6-C_{10} aryl) C_1-C_6 alkyl, (C_6-C_{10} aryl) C_2-C_6 alkenyl, and (C_6-C_{10} aryl) C_2-C_6 alkynyl wherein said alkyl moieties of the foregoing groups are optionally substituted by halo or C_1-C_6 alkyl, and wherein said heterocyclic moieties are optionally substituted by 4- to 10-membered heterocyclic, (4- to 10-membered heterocyclic) C_1-C_6 alkyl, or (C_6-C_{10} aryl) C_1-C_6 alkyl, and further wherein the aryl and heterocyclic moieties of each of the foregoing groups and optional substituents is optionally substituted by 1 to 4 R^7 groups;

R^4 is selected from H, C_1-C_{10} alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, (C_1-C_6 alkoxy) C_1-C_6 alkyl, (C_1-C_6 alkylthio) C_1-C_6 alkyl, (C_5-C_8 cycloalkyl) C_2-C_5 alpha branched alkyl, C_3-C_8 cycloalkyl, C_5-C_8 cycloalkenyl, 3 to 6 membered O or S containing heterocyclic group, or phenyl, wherein each R^4 group may be substituted with from 1 to 3 substituents independently selected from hydroxy, halo, (C_6-C_{10} aryl) C_2-C_6 alkenyl, and C_1-C_4 alkyl;

R^5 and R^{10} are independently selected from H, C_1-C_6 alkyl, C_6-C_{10} aryl, 4- to 10-membered heterocyclic, (4- to 10-membered heterocyclic) C_1-C_6 alkyl and (C_6-C_{10} aryl) C_1-C_6 alkyl, wherein said aryl and heterocyclic groups are optionally substituted by 1 to 4 R^7 groups;

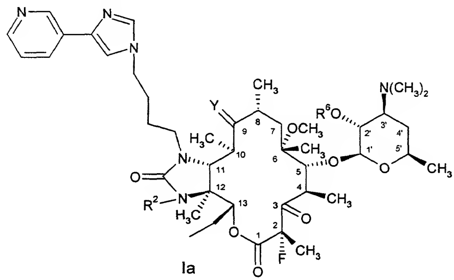
R^6 is H, -C(O)C_1-C_6 alkyl, benzyl, benzyloxycarbonyl, or (C_1-C_6 alkyl)$_3$ silyl;

R^7 is independently selected from halo, cyano, nitro, trifluoromethyl, trifluoromethoxy, azido, -C(O)R^8, -C(O)OR^8, -OC(O)R^8, -NR^{8}C(O)R^9, -C(O)NR^{8}R^9, -NR^{8}R^9, hydroxy, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_6-C_{10} aryl, 4- to 10-membered heterocyclic, and C_1-C_6 alkoxy; and

each R^8 and R^9 is independently selected from H, C_1-C_6 alkyl, C_6-C_{10} aryl, and 4- to 10-membered heterocyclic.

2. The compound of claim 1 wherein Y is =O or =NOR^5, R^1 is (4- to 10-membered heterocyclic) C_1-C_6 alkyl substituted by 4- to 10-membered heterocyclic, R^2 is C_1-C_{10} alkyl or C_2-C_{10} alkenyl, R^3 is C_1-C_6 alkyl, R^4 is ethyl, R^5 is C_1-C_6 alkyl, and R^6 is H.

3. The compound of claim 1 of the formula



Ia

or a pharmaceutically acceptable salt thereof wherein:

Y is =O or =NOR^5;

R^2 is C_1-C_{10} alkyl or C_2-C_{10} alkenyl; and

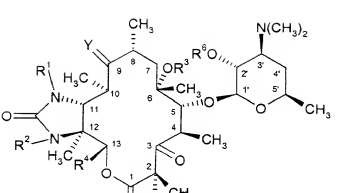
R^6 is H, -C(O)C_1-C_6 alkyl, benzyl, benzyloxycarbonyl, or (C_1-C_6 alkyl)$_3$ silyl.

4. The compound of claim 3 wherein Y is =O and R^6 is H.

5. The compound of claim 3 wherein Y is =NOR^5 and R^6 is H.

6. The compound of claim 4 wherein R^2 is CH_3, CH_2CH_3, $CH_2CH=CH_2$, *trans*-$CH_2CH=CHCH_3$, *trans*-$CH_2CH=CHCH_2CH_3$, or *trans*-CH_2-$CH=C(CH_3)CH_2CH_2CH=(CH_3)CH_3$.

7. A method of preparing a compound of formula I



I

or a pharmaceutically acceptable salt, prodrug, or solvate thereof, wherein

X is Cl, Br, I, or F;

Y is =O, or =NOR^5; or Y means both -H and -OR^5; or both -H and -NR^{5}R^{10};

R^1, R^2, and R^3 are independently selected from H, C_1-C_{10} alkyl, C_2-C_{10} alkenyl, C_2-C_{10} alkynyl, (4- to 10-membered heterocyclic) C_1-C_6 alkyl, (4- to 10-membered heterocyclic) C_2-C_6 alkenyl, (4- to 10-membered heterocyclic) C_2-C_6 alkynyl, (C_6-C_{10} aryl) C_1-C_6 alkyl, (C_6-C_{10} aryl) C_2-C_6 alkenyl, and (C_6-C_{10} aryl) C_2-C_6 alkynyl wherein said alkyl moieties of the foregoing groups are optionally substituted by halo or C_1-C_6 alkyl, and wherein said heterocyclic moieties are optionally substituted by 4- to 10-membered heterocyclic, (4- to 10-membered heterocyclic) C_1-C_6 alkyl, or (C_6-C_{10} aryl) C_1-C_6 alkyl, and further wherein the aryl and heterocyclic moieties of each of the foregoing groups and optional substituents is optionally substituted by 1 to 4 R^7 groups;

R^4 is selected from H, C_1-C_{10} alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, (C_1-C_6 alkoxy) C_1-C_6 alkyl, (C_1-C_6 alkylthio) C_1-C_6 alkyl, (C_5-C_8 cycloalkyl) C_2-C_5 alpha branched alkyl, C_3-C_8 cycloalkyl, C_5-C_8 cycloalkenyl, 3 to 6 membered O or S containing heterocyclic group, or phenyl, wherein each R^4 group may be substituted with from 1 to 3 substituents independently selected from hydroxy, halo, (C_6-C_{10} aryl) C_2-C_6 alkenyl, and C_1-C_4 alkyl;

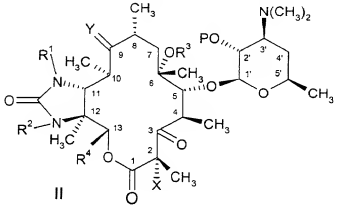
R^5 and R^{10} are independently selected from H, C_1-C_6 alkyl, C_6-C_{10} aryl, 4- to 10-membered heterocyclic, (4- to 10-membered heterocyclic) C_1-C_5 alkyl and (C_6-C_{10} aryl) C_1-C_6 alkyl, wherein said aryl and heterocyclic groups are optionally substituted by 1 to 4 R^7 groups;

R^6 is H, -C(O)C_1-C_6 alkyl, benzyl, benzyloxycarbonyl, or (C_1-C_6 alkyl)$_3$ silyl;

R^7 is independently selected from halo, cyano, nitro, trifluoromethyl, trifluoromethoxy, azido, -C(O)R^8, -C(O)OR^8, -OC(O)R^8, -NR^{8}C(O)R^9, -C(O)NR^{8}R^9, -NR^{8}R^9, hydroxy, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_6-C_{10} aryl, 4- to 10-membered heterocyclic, and C_1-C_6 alkoxy; and

each R^8 and R^9 is independently selected from H, C_1-C_6 alkyl, C_6-C_{10} aryl, and 4- to 10-membered heterocyclic;

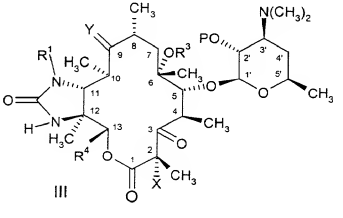
which comprises deprotecting a compound of the formula



II

wherein P is a protecting group.

8. The method of claim 7 further wherein the compound of formula II is prepared by treating a compound of the formula



III

with a strong base and a compound of formula R^2-L, where L is a leaving group.

9. A pharmaceutical composition for the treatment of a bacterial infection or a protozoa infection in a mammal, fish, or bird which comprises a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable salt, prodrug, or solvate thereof, and a pharmaceutically acceptable carrier.

10. A method of treating a bacterial infection or a protozoa infection in a mammal, fish, or bird which comprises administering to said mammal, fish or bird a therapeutically effective amount of a compound of claim 1, or a pharmaceutically acceptable salt, prodrug, or solvate thereof.